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ABSTRACT

Because current fiscal constraints call for inexpensive approaches to achieving equity, school finance research should, in addition to engaging in traditional analysis, address the relationship of curriculum and instruction to equity and economic efficiency. Problems of equity are posed by curriculum decisions and classroom management techniques that partly determine student performance. Cost-effectiveness, delivery systems, and time and cost productivity studies can offer data to help schools allocate resources more efficiently and equitably. Suggestions for research include conceptualizing school time as a zero-sum game in which student and teacher time are scarce resources subject to cost-effectiveness analysis, and studying content differences within schools and classrooms and among districts. The policy links between state departments of education and school districts and between districts and schools and classrooms could also profitably be explored. Classroom and finance researchers could collaborate in exploring policy options for increasing student performance given limited resources. including techniques for better time management. Promising low-cost school improvement methods used or proposed in California are listed. Data generated by school finance research can contribute to creating a climate favorable to adoption and maintenance of reforms altering time, content, materials, and teacher variables. (MJL)

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A NEW SCHOOL FINANCE FOR A NEW ERA OF FISCAL CONSTRAINT

Michael W. Kirst

May 1983

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Abstract

Researchers in economics, political science, administration, and applied finance have most often looked at large-scale problems of equity when comparing policies and funding formulas among schools, among school districts or among states. Only rarely have they looked at the smaller-scale problems of equity posed by the distribution of resources within schools.

The first section of this paper outlines the circumstances responsible for the exclusion of curriculum and instruction policy from school finance research; the second section argues that their inclusion is critical to improving schools. Merging traditional and new approaches to school finance will require new directions for school finance research, some of which are described in the third section. The next section discusses policies that can stretch school budgets and increase equity; and the final section lists low-cost and no-cost ways to carry out new policies.

Although the scope of school finance research has grown with the growth of the public sector, research has stopped at the schoolhouse door. Researchers in economics, political science, administration, and applied finance have for the most part looked at large-scale problems of equity by comparing policies and funding formulas among schools, among districts, or among states. Only rarely have they looked at the smaller scale problems of equity posed by the distribution of resources within schools.

But the fiscal constraints of the 1980s require new types of school finance research that investigate not only the issues of equity but also the micro-issues raised by the relationship of curriculum and instruction to equity and economic efficiency. Research in the 1980s should link what happens inside schools to local and state fiscal policies and seek low-cost or no-cost solutions to the problems of achieving equity in this setting.

The first section of this chapter outlines the circumstances responsible for the exclusion of curriculum and instruction policy from school finance research; the second section argues

that their inclusion is critical to improving schools. Merging traditional and new approaches to school finance will require new directions for school finance research, some of which are described in the third section. The next section discusses policies that can stretch school budgets and increased equity; the last section lists low-cost and no-cost ways to carry out new policies.

SCHOOL FINANCE RESEARCH IN A CHANGING CONTEXT

Although reducing differences in quality among schools has been the major objective of school finance reform, differences in quality persist. Some schools are still less effective than others, and many schools are less effective than they need to be. The blame falls not on finance reform or on finance research but on changing fiscal conditions, politics, and instructional policies.

Changes in fiscal conditions over the past two decades leave only a few energy-rich states able to improve equity and quality through massive money infusions. For most states, the era of increased spending by school districts and reforming school finance by adding new functions or categorical programs has ended. Evidence of changing politics is the unwillingness

of legislators and taxpayers to increase school aid to match inflation. The result of these changes has been described as steady-state funding for education (Odden, McGuire, and Belsches-Simmons 1983).

Changes in curriculum and instructional policies are less well known and have generally been ignored by school finance researchers. Many school districts have abandoned the idea of a core curriculum. Course content has been watered down, curriculum sequences have been fragmented, unconnected electives have been substituted for coherent courses of study, textbooks have been "dummied down," tracking has been expanded. Decoding is stressed more than comprehension and synthesis in reading; computation is stressed more than problem solving in math. The time students are engaged in learning, at school and at home, has diminished in many schools, and so has the attention teachers and administrators devote to instructional policy.

Even though all these changes within schools have lessened the impact of school finance reform, the school finance community has neglected to address them. As a result, many good solutions to problems of equity and quality have been overlooked. Researchers have meticulously calculated the costs of programs for handicapped students, or determined that

frills must be "crowded out" of the curriculum by fiscal necessity. But they have ignored the cost implications of curriculum tracking, watered-down textbooks, and how teachers spend their time.

Part of the problem has been that school finance researchers are better trained to assemble and use aggregate hard data than to study the micro-world of the classroom with its soft data. Theory is limited and research methods only recently developed, so researchers have generally been poorly prepared to analyze the fiscal aspects of curriculum design or teaching strategies. The relationship between inputs and outputs has been analyzed, but the units of analysis have most often been larger than the individual classroom, and the problems addressed usually have been ones amenable to mathematical solution. Complex statistical analyses are not useful techniques for investigating curricular continuity, curricular integration in secondary schools, the organization and management of classrooms, the use of students' and teachers' time, or effective teaching strategies. In short, one reason most researchers have not investigated equity or efficiency inside schools is that their training provides neither the theory nor the tools they need for the investigation.

There have been some detailed studies of the inequities of

school-by-school allocations (Mandel 1975), but these studies have not linked differences in allocations to differences in curriculum and instructional policy. In The Productive School (1971) and later work Alan Thomas came close to outlining a merger of school finance research with research in curriculum and instruction; now that merger is needed, and at full scale (Dreeben and Thomas 1980). The classroom and the school need to be seen from a new theoretical perspective as a problematic economic system in which scarce resources like money, curriculum content, and time must be distributed equitably and efficiently. Lee Shulman (1983:34) put equity in this new perspective:

> The [elementary] teacher must teach not only reading, but all the other mandated subjects as well. Even if an approach to reading instruction can be devised that will adequately accomplish both the individual and collective needs of the full class of pupils, it must not encroach on the time allocated to the other subjects of the curriculum. If reading is taught well at the cost of teaching science not at all, or if adequate coverage of the basic computational skills is achieved through reduction of time available for instruction in

writing, our teacher is once again caught in an "impossible" bind. The notion of a good general education implies breadth of coverage in the several curriculum areas, not only depth in a few. A semblance of equity must be achieved not only among pupils and goals, but also among topics and subjects.

ECONOMIC IMPLICATIONS OF CURRICULUM DECISIONS

Educational policymakers must focus on the school variables that affect student performance -- not on home background and television viewing, for example, which are beyond their reach, but on learning climate and curriculum content. Since Rutter (1979) has written extensively about learning climate, this section concentrates on curriculum content.

Curriculum content is a deceptively simple concept that masks a complex reality of what is taught, what should be taught, what methods are used to teach what subject matter, how much time is spent actually teaching it, and what is actually learned. The curriculum and instruction literature indicates the importance of making these implicit distinctions explicit.

The literature also strongly suggests that curriculum content greatly affects student performance. Walker and Schaffarzick (1974:83), for instance, compared several experimental and conventional curricula (such as new math and old math) and found:

> Students using different curricula in the same subject generally exhibited different patterns of test performance, and these patterns generally reflected differences in content inclusion and emphasis in the curricula.

Content and emphasis affect student performance more than mode (e.g., teacher strategy), or medium (e.g., lecture or television lesson). That is, differences of mode or medium are unlikely to produce achievement differences that compare to the differences produced when students have no opportunity at all to learn about a subject. At the same time, research on effective teaching shows that both poor time management by teachers and ineffective teaching strategies result in less engaged learning time, less content coverage, and lower student performance (Denham and Lieberman 1980).

Conclusions reached by several international achievement studies reinforce the importance of content coverage. After reviewing the International Evaluation of Academic Achievement in 19 nations, Inkeles (1977:179) observed:

> I could find no other characteristic of the school systems of the different countries which showed anything like the same strength of association with test scores as did the sheer time given to instruction and the related variables of opportunity to learn.

Many countries with a deep social commitment to education (e.g., Japan) also require long school days and years. Consequently, some achievement differences may be related to cultural differences as well as time. But Husen (1979:109) commented in a recent book on school systems in the Western world:

> In summing up the analysis of possible factors in the school arena, it is concluded that the strongest explanatory power seems to come from curricular changes. There has been a considerable enrollment drop in the U.S. high school in courses in English

and mathematics. Furthermore, the course enrollment decline is paralleled by a drop in mean scores.

Whether learning materials are challenging or not is another aspect of content that affects achievement. Jeane Chall has indicated, for example, a direct relationship between the use of textbooks that are less challenging and declining scholastic aptitude test (SAT) scores (Chall 1977). The level of challenge in California state-adopted textbooks has dropped by about two grades over the past 10 to 15 years, a loss of content that achievement measures will likely mirror (Trombley 1982).

Since the decisions made in schools and classrooms about curriculum content partly determine student performance, differences in student opportunity to study content become an equity question with both fiscal and educational components. If, for example, low income or minority pupils are largely assigned to classes or tracks where content is undemanding and unchallenging -- defined in any of the ways suggested above -- then they do not receive an equitable education, even if the cost is equal. In other words, curriculum decisions -- choosing a tough text or an easy one, taking academic courses or electives, emphasizing math computation or problem solving

-- are classical marginal allocation issues. This means they can be analyzed through disciplines and with the tools of school finance research (Harnischfeger and Wiley 1980).

This argument does not pose an either-or choice between the equity studies of the 1970s and new studies on instruction in the 1980s. As the West Virginia school finance court case (Pauley v. Bailey) demonstrates, improving schools through traditional analyses of equity remains important. What is needed is a balance between school finance research and research into curriculum design or classroom methods. In retrospect, perhaps some of the technical and administrative problems encountered in the Robinson v. Cahill case in New Jersey could have been avoided if finance and instructional research had been more closely related (Lehne 1978). The skills of the school finance researcher are crucial to curricular improvement in this new era of steady-state funding.

The reluctance of school finance researchers to undertake work of this sort is traditional but understandable. The failure of planning, programming, and budgeting systems (PPBS) and management by objectives (MBO) to enlighten similar discussions in the past may dissuade some researchers, as may the barely noticeable impact of PPBS and prior production

function approaches on policymaking (Burkhead 1967; Kirst 1975). The inappropriateness of analyzing small instructional settings with methods that are typically used to study delivery systems, intergovernmental relations, and categorical programs may discourage other school finance researchers. The difficulty of transcending cultural differences between researchers who study curricular matters or classroom methods and researchers who study school finance is yet another impediment to productive collaboration. Reluctance to brave these discouragements must be overcome, however, for school improvement to have a chance in the 1980s.

School finance and business economics can help us make choices about curricula. Analyzing cost-effectiveness and cost constraints, for example, could inform the research for school improvements with maximum impact on student performance. All this would require is the more sophisticated application of familiar tools to a restricted set of variables -- instructional variables within the existing base of resources. Also helpful would be delivery systems analysis and time and cost productivity studies. Assisting school districts in the 1980s will require better data on what content students are actually covering, how instructional policy can alter content coverage, and how engaged learning time can be improved. In

sum, school finance researchers in the 1980s must investigate how resources can be reconfigured to produce equitable outcomes efficiently.

AN AGENDA FOR SCHOOL FINANCE RESEARCH

Closer scrutiny of school time and content variables reveals a more specific agenda for school finance research. In this section, two ways to conceptualize the time variable are recommended, as are several ways to manipulate the content variable. In practice, however, time and content are less easily separated.

The time students are engaged in learning, measured in minutes per day or courses per academic career, makes a difference in their achievement (Walberg 1982). In California, for example, achievement scores rise with every additional English or mathematics course pupils complete (California State Education Department 1979, 1981). Thomas (1971:32) advances the concept of student time in economic terms:

> Internal time allocation might better be governed by the principle of "foregone learning" rather than "foregone earning." The implication here is that the cost of a given curriculum or of a given

> instructional procedure is measured in part by foregone opportunities to devote students' and teachers' time to other curricula and procedures. Thus, part of a student's cost in attending a class in biology consists of foregoing his opportunities to use this time studying physics or literature. Part of the cost of attending classroom lectures consists of the foregone opportunity to spend this time reading in the library, or engaging in other forms of self-instruction. This concept is a very important one.

That is, school time is a zero-sum game in which student time is one of the scarce resources.

The more conventional way to look at a student's course of study is to examine what is put in, not what is left out. Ralph Tyler (1950), for example, merges time and content considerations in urging that a curriculum be organized around continuity, sequence, and integration. Examination of how California high school students spend their school time, however, discloses a common pattern of unrelated courses, which violates all three of Tyler's very sound principles (California State Education Department 1983). It is also a

pattern that must change in an era of fiscal steady state.

Teacher time is another scarce resource. Curriculum researchers and ingenious teachers have discovered some ways to multiply it and beat the zero-sum game through joint production of outputs (Shulman 1983:16):

> Instead of feeling they must trade off teaching time among too many subjects or too diverse a range of students, they use inventive approaches to subject matter integration (e.g., combining the teaching of reading skills with the study of science, literature, or social studies content) or non-traditional teaching techniques (employing peer tutoring or cooperative learning strategies that take advantage of classroom diversity for the benefit of all pupils) to exploit the opportunities presented by the complexity. But such resolutions are by no means commonplace. They require exceptional expertise -- both in teaching skills and subject-matter knowledge.

Although cost-effectiveness analyses by school finance researchers might help teachers choose among strategies of

this kind, few such analyses are currently available (Levin and Woo 1980).

Reducing class size, increasing the involvement of parents or volunteers, and tailoring staff development to school needs, could increase engaged learning time but would require supplementary resources. Other strategies, like grouping students into new classroom configurations or altering classroom schedules, would require redirecting existing resources. Educators recognize that improving students' independent work habits could be effective but disagree on the best means.

The use of technology as a more efficient delivery system can be implemented by increasing the amount of self-service activities on the part of clients. Just as banks can offer more services when consumers use automatic tellers, so can more instruction be delivered per unit cost when students initiate instructional interactions on their own. Pogrow (1983) outlines two different approaches for incorporating technology in education delivery systems. In a "low-leverage system," technology is used to support and supplement the traditional activities of the teacher. In a "high-leverage system," technology is used to supplant the role of the teacher through home delivery or instruction without the

intervention of an on-site teacher. Cost effectiveness studies in this area are in their infancy.

The notion of unequal time and content opportunities is not new to school finance research. Critics of some standard educational production function studies have noted that programs like grouping or tracking weaken the validity of aggregated school data that do not account for important differences within a school (Guthrie 1971; Bowles and Levin 1968). Differentiating "curriculum paths" overcomes this criticism and represents an approach that can still use conventional measures of per-pupil expenditures, teacher-pupil ratios, and supplies expended. But John Goodlad (1975) observes that the academic rigor of secondary courses with the same title varies greatly (depending on whether a course is part of the college preparatory, general, or vocational curriculum). This suggests that equity be studied by measuring:

1. Content differences among the major curriculum tracks within a school

2. Content differences among student assignments and tests within a single classroom

3. Content differences (and differences of curricula opportunity) among school districts

Finance studies of curricular equity can build on some previous work, but they must also address a number of important new questions. Three brief instances prove the point. First, Garms and Kirst (1972) discovered that poorer school districts in Florida had a much narrower and shallower high school curriculum: property-poor districts could not offer the advanced mathematics, science, or language courses their richer neighbors could afford. Second, the California State Education Department (1982) has recently found that students of low socioeconomic status receive the fewest homework assignments in science and social studies. Last, school districts in California that are most hard pressed financially have shortened the high school day from seven periods to five. Do students of lower socioeconomic status generally have less opportunity to study complex content? If so, why? Do low-spending or low-wealth school districts generally have shorter school days or school years? School finance research can help answer these and other questions that fiscal constraint raises. Schools with one 50-minute period a day less than their affluent neighbors will lose 4,540 minutes of instruction by the semester's end.

POLICY OPTIONS -- AND AN INVITATION

Closely related to time and content are classroom and school management decisions. Because schools are "loosely coupled systems," classroom teachers do have some autonomy (Wirt and Kirst 1982). But decisions made at higher levels in the school hierarchy also determine the range of options in the classroom to some extent, regardless of school (or district or state) policy. School finance research could profitably explore the links between state departments of education and school districts and between school districts and schools and classrooms.

The California State Education Department outlined a number of policy options that express time and learning relationships as new input-output variables (1982). While the study omits the crucial cost-effectiveness component, its points are presented below as an invitation to school finance researchers to explore the cost-effectiveness and equity dimensions of these policy options.

1. Increase the time allocated to instruction.

    - o Lengthen the school day or school year.
    - o Eliminate high school electives; improve the

coordination of instructional content in elementary schools.

- o Increase the amount of homework and tie the content of homework more closely to class instruction.
- o Raise the requirements for admission to universities.

2. Increase the time actually devoted to instruction.
   - o Review programs that disrupt instruction.
   - o Improve teachers' classroom management skills so they reduce breaks, transition time, and start-up time.
   - o Evaluate school schedules (in terms of length of periods, recess, lunch) to minimize lost instructional time.
3. Increase the time that students spend actively learning.
   - o Decrease unsupervised learning activities.
   - o Increase peer tutoring.
   - o Trade off large-group and small-group instructional techniques.

- o Evaluate the use of classroom aides in terms of their contribution to instruction.

4. Reduce the time needed for learning.

   - o Increase clarity and challenge in textbooks.
   - o Improve teachers' ability to diagnose learning problems, sequence instruction, and keep students working at a fast pace.
   - o Use computers and other types of technology for instruction where appropriate.

Current conditions of fiscal steady state demand at least these four responses if limited resources are to produce better student performance. To them school finance research can add knowledge about cost-effectiveness and equity. Such an investigation calls for a change in orientation and a new agenda for school finance research. It also requires a new interdisciplinary approach based on cooperation between classroom researchers and finance researchers.

PROMISING STATE POLICIES IN ACTION

California has begun to use some low-cost or no-cost methods to improve schools, initiated for the most part without

benefit of the analysis that school finance research can offer (Kirst 1982). California's experience to date illustrates that low-cost reform is possible and that it can make for lasting change.

The California system of public higher education has raised admission requirements at every level and specified them more concretely. (Twenty-seven other states have also raised admission requirements in the last two years.) When the California requirements go into effect, college-bound students will have to take more mathematics and English courses -- a no-cost reform that will effectively prevent able students from frittering away their high school years with light course loads. The state universities also will publish detailed lists of proficiencies that students must master before they can be admitted. These lists quickly will affect high school curricula throughout the state. Changes in college admission requirements are like the Carnegie unit: since they are cheap, easily monitored, and backed by a powerful constituency, they should be durable. The difficulty is mustering the political will to raise requirements when colleges and universities, impelled by declining enrollments, are more likely to lower them.

Meanwhile, Californians are using the leverage offered by the policy of adopting textbooks statewide to upgrade textbooks. Teachers, administrators, and parents have demanded that publishers place greater emphasis on problem solving in mathematics texts, return to the more difficult readability levels of 1968, and offer books that challenge high-ability students and better serve the needs of low-ability students. The California State Board has devised new criteria for adopting elementary school textbooks. This reform also has the qualities that make for durability at the same cost.

Detailed analyses of how teachers use classroom time are also under way in California, and county teacher training centers are bringing the topic to teachers' attention. Because these strategies are indirect and may reach teachers who have no desire to change, lasting reform is not inevitable. But many teachers waste instructional time through poor classroom management such as delays in beginning direct instruction while the class gets organized or letting students do homework in class. Nonetheless, California is making a low-cost attempt to confront the problem by using the existing five days for teacher in service in most local teachers' contracts.

California also is developing in service training programs in mathematics and science comparable to the Bay Area Writing

Project, which first trains teachers to write and to teach writing and then sends them back to their school districts to train other teachers. School districts have been encouraged to tie pay raises to training programs like these rather than to randomly chosen college courses that may have little connection to a district's instructional program.

The new California state superintendent of public instruction has proposed linking increased state aid to longer school days or school years. Districts with school days or school years lower than the state average would be required to increase school time in a phased schedule as a condition to receiving state aid. Districts whose total school minutes are already above the new state-mandated levels would receive more state aid without adding any more minutes to the school year. (The state mandate for school time would override local collective bargaining contracts.)

Various types of incentives to improve course content will be proposed in California. Current statewide tests of high school students measure basic skills and minimum competency but not achievement in specific subjects (science, English). The state superintendent of public instruction proposes to institute a modified New York Regents' Test in specific subjects. Students with high scores would receive a Regent's

diploma and priority in the allocation of state scholarships.

The 1980s should also prove a fruitful period for analyzing the cost-effectiveness of attracting and retaining high-quality teachers, especially since there has been very little financial analysis of alternatives since the 1960s (Levin 1970). One crucial issue will be whether higher salaries will attract and retain teachers of mathematics and science.

Reforms that alter time, content, materials, and teacher variables have a good chance of success in a period of fiscal steady state. Meanwhile, educators must campaign to establish a political climate that allows such reforms to endure. By providing data on efficiency and equity, school finance research also helps create a climate in which school improvements are likely to be adopted and to last. But a new outlook, and new research partners, must be part of school finance research efforts for reform in the 1980s.

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